

CLAIMS

1. A frequency controlled lighting system comprising:
 - a motion switch to generate an activation signal in response to movement of the motion switch, the activation signal indicating at least one of duration and frequency of electrical engagement within the motion switch;
 - a controller electrically connected to the motion switch to receive the activation signal; and
 - lighting elements, electrically connected to the controller, the lighting elements selectively actuated by the controller to illuminate the lighting elements in one or more predetermined illumination patterns dependant on the duration and frequency of electrical engagement indicated by the activation signal.
2. The frequency controlled lighting system of claim 1 wherein the motion switch is a spring motion switch including
 - a spring having a fixed end and a free end, and
 - a metal contact positioned proximate the free end of the spring for electrical engagement by the free end of the spring.
3. The frequency controlled lighting system of claim 2 wherein the duration of electrical engagement is the duration of time the free end of the spring electrically engages the metal contact.

4. The frequency controlled lighting system of claim 1 wherein the motion switch is a magnetic reed motion switch including

at least two contacts having a fixed end and a free end, wherein each contact is made of magnetic material, and

an external magnet, positioned proximate the at least two contacts so that during movement of the switch a magnetic field from the external magnet forces the free end of each contact to electrically engage each other.

5. The frequency controlled lighting system of claim 4 wherein the duration of electrical engagement is the duration of time the free end of each contact electrically engage each other.

6. The frequency controlled lighting system of claim 1 wherein the controller comprises:

a triggering circuit electrically connected to the motion switch to receive the activation signal, the triggering circuit creating a triggering signal upon reception of the activation signal;

an oscillator, electrically connected to the triggering means to receive the triggering signal, the oscillator creating a frequency signal upon reception of the triggering signal;

a time-base, electrically connected to the oscillator to receive the frequency signal, the time-base creating a timing signal upon reception of the frequency signal;

a short contact circuit, electrically connected to the time-base for receiving the timing signal and electrically connected to the triggering circuit to receive the activation signal, the short contact circuit generating a short contact signal when the duration of electrical engagement is less than or equal to the predetermined duration level;

a long contact circuit, electrically connected to the time-base to receive the timing signal and electrically connected to the triggering circuit to receive the activation signal, the long contact circuit generating a long contact signal when the duration of electrical engagement exceeds the predetermined duration level;

a fast frequency circuit, electrically connected to the time-base to receive the timing signal and electrically connected to the triggering circuit to receive the activation signal, the fast frequency circuit responsive to the activation signal and the timing signal to compare the frequency of electrical engagement to a predetermined frequency threshold and generating a fast frequency signal when the frequency of electrical engagement is above the predetermined frequency threshold; and

a pattern generator, electrically connected to the time-base to receive the frequency signal, electrically connected to the short contact circuit to receive the short contact signal, electrically connected to the long contact circuit to receive the long contact signal, electrically connected to the fast frequency circuit to receive the fast frequency signal, and electrically connected to the lighting elements to selectively actuate the lighting elements in one or more of a series of

predetermined patterns upon reception of the short contact signal, long contact signal, or fast frequency signal.

7. The frequency controlled lighting system of claim 6 wherein the pattern generator illuminates the lighting elements in one or more of the series of predetermined patterns each time the short contact circuit signals the pattern generator with the short contact signal.

8. The frequency controlled lighting system of claim 7 wherein the pattern generator illuminates the lighting elements in a different pattern each time the short contact circuit signals the pattern generator.

9. The frequency controlled lighting system of claim 6 wherein the pattern generator interrupts any flashing pattern and illuminates a single lighting element in response to receiving the long contact signal from the long contact circuit.

10. The frequency controlled lighting system of claim 9 wherein the pattern generator illuminates the single lighting element until the long contact signal ceases.

11. The frequency controlled lighting system of claim 6 further comprising a sound generating device, activated by the pattern generator when the pattern

generator interrupts any flashing pattern in response to receiving the long contact signal from the long contact circuit.

12. The frequency controlled lighting system of claim 11 wherein the sound generating device creates a sound until the long contact signal ceases.

13. The frequency controlled lighting system of claim 6 wherein the pattern generator interrupts any flashing pattern and illuminates a single lighting element in response to receiving the fast frequency signal from the fast frequency circuit.

14. The frequency controlled lighting system of claim 13 wherein the pattern generator illuminates the single lighting element until the fast frequency signal ceases.

15. The frequency controlled lighting system of claim 6 further comprising a sound generating device, activated by the pattern generator when the pattern generator interrupts any flashing pattern in response to receiving the fast frequency signal from the fast frequency circuit.

16. The frequency controlled lighting system of claim 15 wherein the sound generating device creates a sound until the long contact signal ceases.

17. The frequency controlled lighting system of claim 11 wherein the frequency controlled lighting system is located in a piece of footwear such that the controller and motion switch are located in a heel of the piece of footwear, at least one lighting element is located on the sole of the footwear or the outer surface of the footwear, and the sound generating device is located on the outer surface of the footwear.

18. The frequency controlled lighting system of claim 11 wherein the frequency controlled lighting system is located in a piece of footwear such that the controller and motion switch are located in a heel of the piece of footwear, at least one lighting element is located on the sole of the footwear or the outer surface of the footwear, and the sound generating device is located on the tongue of the footwear.

19. The frequency controlled lighting system of claim 1 wherein the frequency controlled lighting system is located in a piece of footwear such that the controller and motion switch are located in a heel of the piece of footwear and at least one of the lighting element is located on the sole of the footwear.

20. The frequency controlled lighting system of claim 1 wherein the frequency controlled lighting system is located in a piece of footwear such that the controller and motion switch are located in a heel of the piece of footwear and at least one lighting element is located on the outer surface of the footwear.

21. A method for illuminating a series of lighting elements comprising:
- creating an activation signal based on the movement of a motion switch;
 - based on the activation signal, determining a duration of electrical engagement and a frequency of electrical engagement within the motion switch for a period of time;
 - illuminating at least one of a series of lighting elements in response to activation of the motion switch;
 - comparing the duration of electrical engagement to a predetermined duration level to determine an illumination pattern for the series of lighting elements; and
 - comparing the frequency of electrical engagement within the motion switch to a predetermined frequency threshold to adjust the illumination pattern of the series of lighting elements.
22. The method of claim 21 wherein comparing the duration of electrical engagement to a predetermined duration level to determine an illumination pattern for a series of light further comprises:
- illuminating the series of lighting elements in one or more of a series of flashing patterns when the duration of electrical engagement is less than or equal to the predetermined duration level; and

freezing any current flashing pattern and illuminating a single lighting element when the duration of electrical engagement is greater than the predetermined duration level.

23. The method of claim 22 wherein freezing any current flashing pattern and illuminating a single lighting element continues until the electrical engagement which is greater than the predetermined duration level ceases.

24. The method of claim 22 wherein freezing any current flashing pattern and illuminating a single lighting element further comprises activating a sound generating device to produce a sound.

25. The method of claim 24 wherein activating a sound generating device to produce a sound continues until the electrical engagement which is greater than the pre-determine duration level ceases.

26. The method of claim 21 wherein comparing the frequency of electrical engagement within the motion switch to a predetermined frequency threshold to adjust the illumination pattern of the series of light elements further comprises freezing any current flashing pattern of the lighting elements and illuminating a single lighting element when the frequency of electrical engagement is greater than the predetermined frequency threshold.

27. The method of claim 26 wherein freezing any current flashing pattern and illuminating a single lighting element continues until the high frequency of electrical engagement within the motion switch ceases.

28. The method of claim 26 wherein freezing any current flashing pattern and illuminating a single lighting element further comprises activating a sound generating device to produce a sound

29. The method of claim 28 wherein activating a sound generating device to produce a sound continues until the rate of electrical engagement is less than the predetermined frequency threshold.

30. A frequency controlled lighting system comprising:
a motion switch comprising:
a spring having a fixed end and a free end, and
a metal contact positioned proximate the free end of the spring for
electrical engagement by the free end of the spring,
wherein the motion switch generates an activation signal in response
to motion of the motion switch, the activation signal
indicating at least a duration of time that the spring
electrically engages the metal contact;
a controller electrically connected to the motion switch to receive the
activation signal, the controller comprising:

a signal analysis system to analyze the activation signal, and
a pattern generator to receive commands from the signal analysis
system and generate a dependant illumination pattern; and
lighting elements electrically connected to said controller, the lighting
elements selectively actuated by the pattern generator to illuminate the lighting
elements in one or more of a series of predetermined illumination patterns
dependant upon commands from the signal analysis system.

31. The frequency controlled lighting system of claim 30 wherein the signal
analysis system further comprises:

a short contact circuit configured to signal the pattern generator when the
duration of an electrical engagement between the spring and the metal contact is
less than or equal to a predetermined duration level;

a long contact circuit configured to signal the pattern generator when the
duration of the electrical engagement between the spring and the metal contact is
greater than the predetermined duration level; and

a fast frequency circuit configured to signal the pattern generator when the
frequency of electrical engagement between the spring and the metal contact is
greater than a predetermined frequency threshold.

32. The frequency controlled lighting system of claim 31 wherein the pattern
generator illuminates a single lighting element upon activation of the motion
switch.

33. The frequency controlled lighting system of claim 32 wherein the pattern generator illuminates the lighting elements in a flashing pattern when the pattern generator receives a short contact signal from the short contact circuit.

34. The frequency controlled lighting system of claim 33 wherein the pattern generator illuminates the lighting elements in a different pattern each time the pattern generator receives the short contact signal.

35. The frequency controlled lighting system of claim 32 wherein the pattern generator illuminates only the single lighting element when the pattern generator receives a long contact signal from the long contact circuit.

36. The frequency controlled lighting system of claim 35 wherein the pattern generator illuminates only the single lighting element until the long contact signal ceases.

37. The frequency controlled lighting system of claim 35 wherein the pattern generator also activates a sound producing device when the pattern generator receives the long contact signal.

38. The frequency controlled lighting system of claim 37 wherein the pattern generator activates the sound producing device until the long contact signal ceases.

39. The frequency controlled lighting system of claim 33 wherein the pattern generator interrupts any flashing pattern of the lighting elements and illuminates a single lighting element when the pattern generator receives a fast frequency signal from the fast frequency circuit.

40. The frequency controlled lighting system of claim 39 wherein the pattern generator illuminates the single lighting element until the fast frequency signal ceases.

41. The frequency controlled lighting system of claim 33 wherein the pattern generator interrupts any flashing pattern of the lighting elements and activates a sound producing device when the pattern generator receives a fast frequency signal from the fast frequency circuit.

42. The frequency controlled lighting system of claim 41 wherein the pattern generator activates the sound producing device until the fast frequency signal ceases.

43. Footwear including a controlled lighting system comprising:
a motion switch to generate an activation signal in response to movement of the motion switch, the activation signal indicating at least one of duration and frequency of electrical engagement within the motion switch;

a controller electrically connected to the motion switch to receive the activation signal; and

lighting elements, electrically connected to the controller, the lighting elements selectively actuated by the controller to illuminate the lighting elements in one or more predetermined illumination patterns dependant on the duration and frequency of electrical engagement indicated by the activation signal.

44. Footwear including the frequency controlled lighting system of claim 43 wherein the motion switch is a spring motion switch including

a spring having a fixed end and a free end, and

a metal contact positioned proximate the free end of the spring for electrical engagement by the free end of the spring.

45. Footwear including the frequency controlled lighting system of claim 44 wherein the duration of electrical engagement is the duration of time the free end of the spring electrically engages the metal contact.

46. Footwear including the frequency controlled lighting system of claim 43 wherein the motion switch is a magnetic reed motion switch including

at least two contacts having a fixed end and a free end, wherein each contact is made of magnetic material, and

an external magnet, positioned proximate the at least two contacts so that during movement of the switch a magnetic field from the external magnet forces the free end of each contact to electrically engage each other.

47. Footwear including the frequency controlled lighting system of claim 46 wherein the duration of electrical engagement is the duration of time the free end of each contact electrically engage each other.

48. Footwear including the frequency controlled lighting system of claim 43 wherein the controller comprises:

a triggering circuit electrically connected to the motion switch to receive the activation signal, the triggering circuit creating a triggering signal upon reception of the activation signal;

an oscillator, electrically connected to the triggering means to receive the triggering signal, the oscillator creating a frequency signal upon reception of the triggering signal;

a time-base, electrically connected to the oscillator to receive the frequency signal, the time-base creating a timing signal upon reception of the frequency signal;

a short contact circuit, electrically connected to the time-base for receiving the timing signal and electrically connected to the triggering circuit to receive the activation signal, the short contact circuit generating a short contact signal when

the duration of electrical engagement is less than or equal to the predetermined duration level;

a long contact circuit, electrically connected to the time-base to receive the timing signal and electrically connected to the triggering circuit to receive the activation signal, the long contact circuit generating a long contact signal when the duration of electrical engagement exceeds the predetermined duration level;

a fast frequency circuit, electrically connected to the time-base to receive the timing signal and electrically connected to the triggering circuit to receive the activation signal, the fast frequency circuit responsive to the activation signal and the timing signal to compare the frequency of electrical engagement to a predetermined frequency threshold and generating a fast frequency signal when the frequency of electrical engagement is greater than the predetermined frequency threshold; and

a pattern generator, electrically connected to the time-base to receive the frequency signal, electrically connected to the short contact circuit to receive the short contact signal, electrically connected to the long contact circuit to receive the long contact signal, electrically connected to the fast frequency circuit to receive the fast frequency signal, and electrically connected to the lighting elements to selectively actuate the lighting elements in one or more of a series of predetermined patterns upon reception of the short contact signal, long contact signal, or fast frequency signal.

49. Footwear including the frequency controlled lighting system of claim 48 wherein the pattern generator illuminates the lighting elements in one or more of the series of predetermined patterns each time the short contact circuit signals the pattern generator with the short contact signal.

50. Footwear including the frequency controlled lighting system of claim 49 wherein the pattern generator illuminates the lighting elements in a different pattern each time the short contact circuit signals the pattern generator.

51. Footwear including the frequency controlled lighting system of claim 48 wherein the pattern generator interrupts any flashing pattern and illuminates a single lighting element in response to receiving the long contact signal from the long contact circuit.

52. Footwear including the frequency controlled lighting system of claim 51 wherein the pattern generator illuminates the single lighting element until the long contact signal ceases.

53. Footwear including the frequency controlled lighting system of claim 48 further comprising a sound generating device, activated by the pattern generator when the pattern generator interrupts any flashing pattern in response to receiving the long contact signal from the long contact circuit.

54. Footwear including the frequency controlled lighting system of claim 53 wherein the sound generating device creates a sound until the long contact signal ceases.

55. Footwear including the frequency controlled lighting system of claim 48 wherein the pattern generator interrupts any flashing pattern and illuminates a single lighting element in response to receiving the fast frequency signal from the fast frequency circuit.

56. Footwear including the frequency controlled lighting system of claim 55 wherein the pattern generator illuminates the single lighting element until the fast frequency signal ceases.

57. Footwear including the frequency controlled lighting system of claim 48 further comprising a sound generating device, activated by the pattern generator when the pattern generator interrupts any flashing pattern in response to receiving the fast frequency signal from the fast frequency circuit.

58. Footwear including the frequency controlled lighting system of claim 57 wherein the sound generating device creates a sound until the long contact signal ceases.

59. Footwear including the frequency controlled lighting system of claim 43 wherein the motion switch is located in a heel of the footwear.

60. Footwear including the frequency controlled lighting system of claim 43 wherein the controller is located in a heel of the footwear.

61. Footwear including the frequency controlled lighting system of claim 43 wherein the lighting elements are located in the sole of the footwear.

62. Footwear including the frequency controlled lighting system of claim 43 wherein the lighting elements are located in the outer surface of the footwear.

63. Footwear including the frequency controlled lighting system of claim 43 wherein the lighting elements are located in both the sole of the footwear and the outer surface of the footwear.

64. Footwear including the frequency controlled lighting system of claim 57 wherein the sound generating device is located on the outer surface of the footwear.

65. Footwear including the frequency controlled lighting system of claim 57 wherein the sound generating device is located on the tongue of the footwear.

66. A light flashing system comprising lighting elements and a control circuit to selectively illuminate the lighting elements in a predetermined pattern according to one of duration and frequency of engagement of a switch.